Claims

What is claimed is:

1. A method of reservoir fracture characterization, the method comprising:

obtaining seismic traces;

combining seismic traces into gathers that reveal acoustic reflectivity as a function of offset, azimuth, and position;

measuring reflection anisotropy as a function of position;

determining a relationship between reflection anisotropy and fracture intensity measurements at specific positions; and

applying the relationship to reflection anisotropy measurements to create a set of fracture intensity measurements at regularly-spaced positions.

2. The method of claim 1, wherein the specific positions are locations of preexisting wells.

3. The method of claim 2, wherein the fracture intensity measurements take form as a production measure.

4. The method of claim 3, wherein the production measure is a four month cumulative fluid production.

5. The method of claim 1, wherein said determining a relationship includes using multiple regression to identify a statistical dependence of the fracture intensity measurement on reflection anisotropy.

6. The method of claim 1, wherein said determining a relationship includes training a neural network to predict a fracture intensity measurement in response to a set of input values, the set including reflection anisotropy.

7. The method of claim 1, further comprising:

   displaying the set of fracture intensity measurements as function of two spatial dimensions.

8. The method of claim 7, wherein the set of fracture intensity measurements is displayed as a map.

9. The method of claim 1, further comprising:

   displaying the set of fracture intensity measurements as a function of three spatial dimensions.

10. The method of claim 1, further comprising:

   correlating a set of seismic attributes with the fracture intensity measurements at specific

      positions, wherein the set of seismic attributes includes reflection anisotropy,

   wherein said determining a relationship between reflection anisotropy and fracture intensity measurements further includes determining a relationship between fracture intensity and those seismic attributes that are well-correlated with the fracture intensity measurements.

11. The method of claim 10, wherein said correlating is performed using a rank-correlation technique.

12. A system for reservoir fracture characterization, the system comprising:

an information storage device having seismic traces; and

a processor configured to retrieve and process the seismic traces to determine an array of

reflection anisotropy values,

wherein the processor is further configured to determine a relationship between reflection

anisotropy and a measure of fracture intensity at one or more well positions.

13. The system of claim 12, wherein the measure of fracture intensity relates to fluid production

from wells at the one or more well positions.

14. The system of claim 12, wherein the measure of fracture intensity is a four month cumulative

fluid production.

15. The system of claim 12, wherein the processor is configured to determine said relationship

using multiple regression.

16. The system of claim 12, wherein the processor is configured to determine said relationship

by training one or more neural networks.

17. The system of claim 12, further comprising:

a graphical display coupled to the processor and configured to present a view of fracture

intensity measurements as a function of position, wherein the processor is configured to

generate said view by applying said relationship to an array of reflection anisotropy values.

18. The system of claim 17, wherein the display presents fracture intensity measurements as a function of two spatial dimensions.

19. The system of claim 17, wherein the display presents fracture intensity measurements as a function of three spatial dimensions.